

REMARKS

This Amendment is fully responsive to the non-final Office Action dated April 15, 2009, issued in connection with the above-identified application. Claims 1 and 3-13 are pending in the present application. With this Amendment, claim 1 has been amended. No new matter has been introduced by the amendments made to claim 1. Favorable reconsideration is respectfully requested.

In the Office Action, claims 10-13 have been objected to, but would be allowable if rewritten in independent form to include all the limitations of the base claim and any intervening claims. The Applicant has decided not to rewrite claims 10-13 (as suggested) at this time because the claim amendments and arguments provided herein are believed to be sufficient to overcome the rejection to the base claim (i.e., claim 1) from which claims 10-13 depend.

In the Office Action, claims 1 and 3 have been rejected under 35 U.S.C. 102(b) as being anticipated by Matsumoto (U.S. Patent No. 4,984,003, hereafter "Matsumoto"). The Applicant has amended independent claim 1 to help further distinguish the present invention from the cited prior art. Claim 1, as amended, recites the following features:

“[a] blade driving device for use in cameras, the blade driving device comprising:

a mechanical blade openably and closably disposed in front of an image pickup element, the mechanical blade being operable to block a part or all of light passing through an exposure aperture or to reduce light passing therethrough;

an electromagnetic actuator being operable to enable the blade to perform an opening motion according to opening energization and to enable the blade to perform a closing motion according to closing energization; and

a control means for drive-controlling the electromagnetic actuator and applying opening energization and closing energization to the electromagnetic actuator so as to allow the blade to perform an opening motion to move into an opened state when turning on an electric-power supply in order to set a photographable standby state in which a dynamic image and a still image are photographable, and to first perform an opening motion when a releasing operation is performed, and then to perform a closing motion for completion of a photograph.” (Emphasis

added).

The present invention (as recited in independent claim 1) includes a mechanical blade openably and closably disposed in front of an image pickup element, the mechanical blade is operable to block a part or all of light passing through an exposure aperture or to reduce light passing therethrough. An electromagnetic actuator is operable to enable the blade to perform an opening motion according to opening energization and to perform a closing motion according to closing energization.

A control means is operable to drive-control the electromagnetic actuator and to apply an opening energization and closing energization to the electromagnetic actuator, which allows the blade to perform an opening motion (to move into an opened state) when turning on an electric power supply in order to set a photographable standby state in which a dynamic image and a still image are photographable. Additionally, the control means is operable to first perform an opening motion when a releasing operation is performed, and then to perform a closing motion for completion of photography.

The present invention (as recited in independent claim 1) is distinguishable over the cited prior art at least for the reasons noted below.

(i) A mechanical blade is disposed in front of an image pickup element.

And, a control means applies energization to an electromagnetic actuator as follows:

(a) first, when turning on an electric power supply in order to set a photographable standby state in which a dynamic image and a still image are photographable, the control means applies opening energization so as to allow the blade to perform an opening motion to move into an opened state; and

(b) next, when a releasing operation is performed, the control means first applies opening energization so as to allow the blade to perform an opening motion again and then applies closing energization so as to allow the blade to perform a closing motion to move into a closed state for completion of photography.

The present invention (as recited in claim 1) provides clear advantages and unexpected results over the cited prior art. For example, since the control means applies opening

energization so as to allow the blade to perform an opening motion again when a releasing operation is performed (e.g., even if the blade to be kept in the opened state in a photographable standby state has been closed without permission by an impulsive force from the outside) the blade is invariably positioned in the opened state immediately before photography (immediately after releasing operation) so that photography can be reliably performed. Since opening energization is invariably performed without judging the state of the blade, the control operation can be simplified.

In the Office Action, the Examiner relies on Matsumoto for disclosing or suggesting all the features recited in independent claim 1. However, the Applicant asserts that Matsumoto fails to disclose or suggest all the features now recited in independent claim 1.

Matsumoto discloses that "[i]n a single lens reflex camera of the lens shutter type, the shutter must be kept opened at all times prior to the exposure for enabling the operator to view the scene to be photographed through the opened shutter while the photosensitive material is prevented from being exposed to the scene light by a light intercepting plate or a reflecting mirror and, after the focusing is completed, the shutter is once closed upon actuation of release means of the camera and then the shutter blade is opened and closed for effecting the required exposure. Therefore, the shutter blade must be biased by spring means or the like so as to be kept opened stably at all times" (see col. 7, lines 48-60).

Matsumoto also discloses that "Fig. 8 shows the relationship between the course of application of the opening current i_1 and the closing current i_2' and the opening and closing curve of the shutter blade 1 obtained by the application of the opening and closing currents i_1 , i_2' to the stationary coil 7. Starting from the time point to at which the release means of the camera is actuated by the operator, the closing current i_2' is first applied to the coil 7 and the shutter blade 1 which has been opened for the focusing purpose begins to be closed at the time point t_1 after the mechanical delay time of the shutter and fully closed at the time point t_2 at which the opening current i_1 is applied to the coil 7 for the exposure of the camera so that the shutter blade 1 begins to be opened at the time point t_3 after the mechanical delay time of the shutter with the aid of the action of the spring 18."

Additionally, Matsumoto discloses that “[t]he opening current i_1 is intercepted at the time point t_4 and the closing current i_2' is applied to the coil 7 a predetermined time period before the shutter blade comes to the fully opened position for avoiding the severe impact of the shutter blade 1 against the stopper means at the fully opened position, and the shutter blade 1 reaches the fully opened position at the time point t_5 by the inertia of the movement of the shutter blade 1 and the shutter blade 1 begins to be closed at the time point t_5 and is fully closed at the time point t_6 . The closing current i_2' is intercepted at the time point t_7 after the completion of the exposure and the shutter blade 1 begins to be again opened by the action of the spring 18 at the time point t_8 after the mechanical delay time so as to be ready for the focusing purpose for the next exposure” (see col.8, lines 13-44).

Based on the above discussion of Matsumoto, the reference more accurately discloses a shutter device for use in a single lens reflex camera in which a film (photosensitive material) is used that includes: a mechanical blade (1) openably and closably disposed in front of a light intercepting plate or a reflecting mirror as well as a film (photosensitive material), but not an image pickup element; an electromagnetic actuator (4) for driving the shutter blade; and a control means for drive-controlling the electromagnetic actuator. Additionally, for the shutter device, in the standby state, the shutter blade 1 is moved into an opened state by the action of the spring 18.

Also, in Matsumoto, when a releasing operation is performed, the control means performs the following features:

- (i) (firstly) applies closing energization so as to allow the blade to perform an closing motion in order to prevent the photosensitive material (film) from being exposed to the scene light when withdrawing the light intercepting plate or the reflecting mirror from the light pass in front of the photosensitive material (film);
- (ii) (secondly) applies opening energization so as to allow the blade to perform an opening motion for exposure (in order to expose the photosensitive material (film); and then
- (iii) (thirdly) applies closing energization so as to allow the blade to perform a closing motion for completion of photography.

In other words, Matsumoto does not disclose or suggest that (i) the mechanical blade is disposed in front of an image pickup element; (ii) first when turning on an electric-power supply in order to set a photographable standby state in which a dynamic image and a still image are photographable, the control means applies opening energization so as to allow the blade to perform an opening motion to move into an opened state; and (iii) next when a releasing operation is performed, the control means first applies opening energization so as to allow the blade to perform an opening motion again and then applies closing energization so as to allow the blade to perform a closing motion to move into a closed state for completion of photography (i.e., as recited in independent claim 1).

Accordingly, the present invention (as recited in claim 1) is directed to a digital camera including an image pickup element, whereas Matsumoto is directed to a film-type camera. Additionally, the releasing operation of the present invention is characterized by firstly an opening motion and then a closing motion, whereas the releasing operation of Matsumoto is to be performed by firstly a closing motion, secondly an opening motion, and then thirdly a closing motion. Based on the above discussion, the present invention (i.e., as recited in independent claim 1) is not anticipated by Matsumoto. Likewise, claim 3 is not anticipated by Matsumoto at least by virtue of its dependency from independent claim 1.

In the Office Action, claims 4 and 5 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto; claims 6 and 7 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto in view of Ikeda (Japanese Patent Application No. 2001-183718, hereafter "Ikeda"); and claims 8 and 9 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto.

Claims 4, 5, 6, 7, 8 and 9 depend (directly or indirectly) from independent claim 1. As noted above, Matsumoto fails to disclose or suggest all the features of independent claim 1. Moreover, Ikeda fails to overcome the deficiencies noted above in Matsumoto.

Specifically, Ikeda discloses a shutter device for use in a digital camera. The shutter device includes (as shown in Figs. 1, and 2) a plurality of mechanical blades (3, 3a); an electromagnetic actuator (5) driving the blades; a sensor (4) for detecting a position of the blades;

and a control means.

In the shutter device of Ikeda, the sensor (4) monitors a position of the blades, when the blades have moved into a closed state, the control means controls the blades to move into an opened state. Additionally, as shown in Fig. 8 of Ikeda, the control means controls the blades so as to perform an opening motion only before a releasing operation is performed. In other words, in the standby state before a releasing operation is performed, the control means applies opening energization so as to allow the blade to perform an opening motion to move into an opened state at all times, and when a releasing operation is performed, the control means applies only closing energization so as to allow the blade to perform a closing motion to move into a closed state for completion of photography.

Similar to Matsumoto, Ikeda does not disclose or suggest that (ii) first when turning on an electric-power supply in order to set a photographable standby state in which a dynamic image and a still image are photographable, the control means applies opening energization so as to allow the blade to perform an opening motion to move into an opened state, (iii) next when a releasing operation is performed, the control means applies opening energization so as to allow the blade to perform an opening motion again and then applies closing energization so as to allow the blade to perform a closing motion to move into a closed state for completion of photography (i.e., as recited in independent claim 1).

In summary, the present invention (as recited in independent claim 1) includes the features noted below, which are not disclosed or suggested by the cited prior art.

(i) A mechanical blade disposed in front of an image pickup element.

And, a control means that applies energization to an electromagnetic actuator as follows:

(ii) first, when turning on an electric-power supply in order to set a photographable standby state in which a dynamic image and a still image are photographable, the control means first applies opening energization so as to allow the blade to perform an opening motion to move into an opened state; and

(iii) next, when a releasing operation is performed, the control means applies opening energization so as to allow the blade to perform an opening motion again and then applies

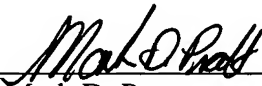
closing energization so as to allow the blade to perform a closing motion to move into a closed state for completion of photography.

Thus, even if a person of ordinary skill in the art were to combine the teachings of the cited prior art, the combination still would not disclose or suggest all the features and the advantages of the present invention noted above (i.e., with reference to independent claim 1). Accordingly, no combination of Matsumoto and Ikeda would result in, or otherwise render obvious, claims 4, 5, 6, 7, 8 and 9 at least by virtue of their dependencies from independent claim 1.

In light of the foregoing, the Applicant respectfully requests that the Examiner withdraw the rejections presented in the outstanding Office Action, and pass the present application to issue. The Examiner is invited to contact the undersigned attorney by telephone to resolve any remaining issues.

Respectfully submitted,

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